

REMARKS

Claims 1 and 4-14 remain in the application.

The Rejections:

In the Office Action dated June 28, 2006, the Examiner rejected Claims 1, 4-8, 10, 11, 13 and 14 under 35 U.S.C. 103(a) as being unpatentable over Baranda (WO 99/43589) in view of Kinoshita (US-5891561) in further view of Danhauer (US 2002/0098935).

Referring to Claims 1 and 4-6, the Examiner stated that Baranda discloses (see Figs. 1-8 and respective portions of the specification) a drive motor (42) mounted at a head of an elevator shaft and having a drive pulley; an elevator car (16) movable in the elevator shaft; a counterweight (48) movable in the elevator shaft and arranged laterally of the elevator car (See Pg. 2 - Pg. 3 I. 17 & Fig. 2) and further discloses a flat-belt-like support means supporting the elevator car by under looping and engaging the drive pulley. The Examiner admitted that Baranda does not disclose the support means being a wedge-ribbed belt having a running surface facing the drive pulley and a plurality of ribs and grooves formed with an angle in the range of 80 to 100 degrees in the running surface and extending in parallel in a longitudinal direction of the support means. The Examiner stated that Kinoshita discloses (See Figs. 1- 3 and respective portions of the specification) a wedge-ribbed belt (10) with ribs and grooves being one of triangular-shaped and trapezium-shaped in cross section (See at least Col. 3 L. 12-30 and at least Fig. 1). The Examiner stated that Danhauer discloses a belt (10) with a plurality of ribs and grooves formed in the running surface and extending in parallel in a longitudinal direction on the support means (See Sect. 0017 & Figs. 1-2) and that the belt (10) is provided with a plurality of transverse grooves (34) (See Sect. 0025) and that the grooves are provided at an inclined angle between 20° and 85°. The Examiner further noted that the Danhauer belt (10) has at least two wedge-ribbed belt strands arranged in parallel (See Figs. 1-2). The Examiner is of the opinion that it would have been obvious to a person of ordinary skill in the art to modify the apparatus of Baranda to include the teachings of Danhauer and provide a wedge-ribbed belt with a plurality of ribs and grooves formed in the running surface as well as transverse grooves and ribbed strands

formed at an angle between 80 to 100 degrees as taught by Kinoshita and Danhauer so that the belt could provide better traction, increased flexibility, and a higher load capacity.

Referring to Claim 7, the Examiner admitted that Baranda does not disclose that the drive pulley has an external diameter in a range of 70 to 100 millimeters, but stated that it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the apparatus of Baranda to include drive pulleys that were in the range of 70 to 100 millimeters so that greater torque and lifting capacity could be achieved.

Referring to Claim 8, the Examiner stated that Baranda discloses that the car guide rail (60, 64) is mounted on two opposite sides of the elevator car and two counterweight guide rails (62, 66) mounted on a counterweight side of the elevator car and the drive motor with the drive pulley being mounted on a motor carrier (36) attached to one of the car guide rails and to the two counterweight guide rails (See Pg. 4 - Pg 5 L.23 & Figs. 1-2).

Referring to Claim 10, the Examiner stated that Baranda discloses an elevator wherein said drive motor and said drive pulley are mounted above a space in the elevator shaft taken up by said elevator car, a plane of said drive pulley being arranged vertically and at right angles to a car wall at a counterweight side of said elevator car and approximately in a middle of a car depth of said elevator car, a vertical projection of said drive pulley onto said counterweight side of said elevator car being outside a vertical projection of said counterweight side, and a part of a vertical projection of said drive motor being superimposed on said vertical projection of said counterweight side of said elevator car (See Figs. 1-2).

Referring to Claims 11, 13 and 14, the Examiner stated that Baranda discloses an elevator system wherein the belt extends from a support means fixing point below said drive pulley and in a region of a vertical projection of said drive pulley, downwardly to a side, which faces said elevator car of a periphery of a counterweight support roller, loops around said counterweight support roller, extends to a side remote from said elevator car of a periphery of said drive pulley, loops around said drive pulley and runs downwardly along a car wall at a counterweight side of said elevator car, loops by 90 around a respective car support roller mounted below said elevator car on each of two sides of said elevator car and runs along a car wall remote from said counterweight upwardly to a second support means fixing point in the elevator shaft. Baranda

further discloses an elevator system having a drive motor mounted at the head of the elevator shaft and having a drive pulley for engaging the support, comprising a belt adapted to support the elevator car by underlooping and engaging the drive pulley. The Examiner admitted that Baranda does not disclose that the belt is wedge-ribbed belt that has a running surface adapted to face the drive pulley and a plurality of substantially triangular-shaped and trapezium shaped ribs and grooves formed in the running surface and extending in parallel in a longitudinal direction of the belt. The Examiner stated that Danhauer discloses the belt is a wedge-ribbed belt that has a running surface adapted to face the drive pulley and a plurality of ribs and grooves formed in the running surface and extending in parallel in a longitudinal direction of the belt (See at least Fig. 1) and it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the apparatus to include a belt as taught by Danhauer and Kinoshita so that greater traction could be achieved as well as a higher load capacity.

The Examiner rejected Claim 9 under 35 U.S.C. 103(a) as being unpatentable over Baranda in view of Danhauer and in further view of Faletto (6471012). The Examiner admitted that Baranda does not disclose a brake unit mounted on the motor, carrier for acting upon the drive pulley. The Examiner stated that Faletto discloses (See Figs. 1-2 and respective portions of the specification) a brake acting on a drive pulley to prevent rope movement and that the brake could be positioned to act on the rope, on a pulley mounted on the elevator car, or on an auxiliary pulley (See Col. 5 I. 9-14). The Examiner noted that it is generally known in the field of art to provide a brake to act on the drive pulley to prevent movement and that it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the apparatus of Baranda to include a brake unit to act on the drive pulley to prevent movement in order to slow and stabilize the elevator car.

The Examiner rejected Claim 12 under 35 U.S.C. 103(a) as being unpatentable over Baranda in view of Danhauer and in further view of Saito (US-5025893). The Examiner admitted that Baranda does not disclose that the guide roller mounted at the bottom of the elevator car and engaging the wedge-ribbed belt, in which the guide roller has a plurality of ribs and grooves engaging the ribs and grooves of the wedge-ribbed belt for guidance of the wedge-ribbed belt. The Examiner stated that Saito discloses (See Figs. 1- 5 and respective portions of

the specification) guide rollers (11, 12) having a plurality of ribs and grooves for engaging the ribs and grooves of the rope for guidance of the rope (See at least Col. 2 L. 45 - 66, Col. 3 L. 25 - 30 & at least Figs. 4-5) and it would have been obvious to a person of ordinary skill in the art at the time of the invention in view of Saito to modify the apparatus of Baranda to include guide rollers that had a plurality of ribs and grooves that engaged the ribs and grooves of the belt so that a elevator could receive greater traction and a higher load capacity.

The Response:

The Examiner rejected independent Claims 1 and 13 as being unpatentable over Baranda in view of Kinoshita and Danhauer. The Examiner stated that Danhauer discloses a belt having "at least two wedge-ribbed belt strands arranged in parallel" and "provided with a plurality of transverse grooves (34) (See Sect. 0025) ... at an inclined angle between 20° and 85°."

Claim 1 defines an elevator system including "a belt support means supporting said elevator car ..., said support means being a wedge-ribbed belt having a running surface ... and a plurality of ribs and grooves formed in said running surface and extending in parallel in a longitudinal direction of said support means, said ribs and grooves being one of triangular-shaped and trapezium-shaped in cross section and said ribs and grooves being formed with lateral flanks at an angle in a range of 80° to 100°." (underlining added)

Claim 13 defines an elevator car support for use in an elevator system comprising a wedge-ribbed belt having the identical features as recited in Claim 1.

Danhauer shows a wedge-ribbed belt having a plurality of ribs and grooves formed in its running surface and extending in parallel in a longitudinal direction of the belt, the ribs and grooves being trapezium-shaped in cross section. However, in contrast to Applicant's claimed invention, the Danhauer belt is provided with a plurality of transversely extending grooves in its compression section (the compression section is the section of the belt with the longitudinally extending ribs and grooves), the transverse grooves being inclined at an angle of 20° to 85° relative to the direction of the longitudinal grooves. (See par. [0025] of Danhauer) Thus, the Danhauer angle range of 20° to 85° refers to the direction of the transversely extending

grooves and has nothing whatsoever to do with the angle of formation of the flanks of the longitudinally extending ribs and grooves as recited in Applicant's claims.

The angle of 80° to 100° as specified in Applicant's Claims 1 and 13 is related to the angle between the flanks (see angle "b" in Figs. 3 and 4) of the triangular-shaped or trapezium-shaped cross sections of the ribs and grooves extending parallel to the longitudinal direction of the belt. The angle of 20° to 85° specified in the Danhauer document is related to the angle between the transverse grooves 34 extending across the compression section of the belt and the longitudinal grooves 20 extending in the direction of the belt.

It is obvious that the angle range as specified in the Danhauer document defines a completely different geometric feature of a wedge-ribbed belt than the angle range as specified in Applicant's Claims 1 and 13 (Applicant's belt does not even have any grooves extending transversely to the longitudinal direction of the belt).

The characteristic feature of Applicant's claims that the (triangular-shaped and trapezium-shaped) ribs and grooves are formed with lateral flanks at an angle in a range of 80° to 100° is not shown in or suggested by Danhauer. The invention according to the pending claims is not shown in or suggested by any combination of the references cited by the Examiner in his rejections of the claims.

The Examiner listed the following U.S. Patent Documents on Form PTO-892 without comment: Heinz et al. (6471012); Nakajima et al. (5387160); Hein (5944144); and Kitano et al. (6056656). Applicant reviewed these references and found them to be no more pertinent than the prior art relied upon by the Examiner in the rejections.

In view of the above arguments, Applicant believes that the claims of record now define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.